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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/606,965 | 06/27/2003 | Gan Lin Hwang | Q76295 | 4841 |
| 23373 | 7590 | 12/29/2005 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | STADLER, REBECCA M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1754 | |

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/606,965 | HWANG, GAN LIN | |
| | Examiner | Art Unit | |
| | Rebecca M. Stadler | 1754 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. None of the examples in the specification describe either cycloaddition or a radical addition reaction. It appears that these reactions do not happen.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a.) Claim 6 is unclear insofar as D is a terminal group with 2 things bonded to it, which is impossible.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5-12, 14-17, 19-22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lieber 6,159,742.

As to claim 1, Lieber '742 discloses a carbon nanotube (see column 1, lines 39-41) having an organic functionalization (see column 1, lines 48-67). The formula disclosed is: $X-(L-M)_n$, wherein L-M is deemed to meet the limitation of an organic functional group. Further, on page 2 of the specification, applicant incorporates "application No. _____ and _____)." It appears that patent application 10/255669, and USP 6,872,236 were meant. The above application and patent disclose an arc discharge method for producing nanocapsules,

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which is a standard method for producing carbon nanotubes. As such, despite applicant's limitation of a nanocapsule, no difference is seen between the nanocapsule of the present invention and the nanotube of Lieber.

As to claims 2, 3, and 5, Lieber '742 discloses a multi-walled carbon nanotube (see column 2, lines 33-39) with a diameter of 1-200 nm (see column 2, lines 24-26) and being hollow (see column 2, line 24). In the carbon nanotube formula, n is 1 to 100 (see column 1, line 55).

Lieber is deemed to meet claim 6 because of the various possible combinations (see column 4, lines 25-40).

As to claims 7-9, these are product by process limitations. It appears that the instantly claimed product by process is the same as that which is claimed. When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. See, e.g., In re Brown, 459 F.2d 531, 173 U.S.P.Q. 685 (CCPA 1972); In re Fessman, 489 F.2d 742, 180 U.S.P.Q. 324 (CCPA 1974).

As to claim 10, Lieber teaches the functional groups of hydroxy (see column 4, lines 8-9), carboxylic acid (see column 4, lines 27-29), aldehydes and ketones (see column 4, lines 34-36).

Claims 11, 12, and 14 are rejected as above.

As to claim 15, Lieber teaches the functional groups of amides (see column 4, lines 31-34, see also column 4, lines 1-3).

Claims 16, 17, and 19 are rejected as above.

As to claim 20, Lieber teaches the functional group of hydroxy (see column 4, line 8-9).

Claims 21, 22, and 24 are rejected as above.

Claims 1-2, 4-5, 7-11, 13-16, 18-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff 5,547,748.

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As to claims 1- 2 and 4-6, Ruoff '748 discloses a nanoencapsulate with layers of polyhedral carbon that encapsulates metal (see column 2, lines 32-36). The outer diameter of the nanoencapsulate is between 5 nm and 1,000 nm (see column 2, lines 37-39). The metal encapsulated can be a metal, alloy or carbide (see column 4, line 55 – column 5, line 2). Ruoff suggests derivatizing the nanoencapsulates (see column 11, lines 9-59). Although Ruoff does not teach the formula $F(-E)_n$ for the nanoencapsulates, Ruoff is deemed to meet the limitations of the present invention because it teaches functionalizing nanonencapsulates in the same manner as the present invention (column 8, lines 53-67).

As to claims 7-9, these are product by process limitations. It appears that the instantly claimed product by process is the same as that which is claimed. When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. See, e.g., In re Brown, 459 F.2d 531, 173 U.S.P.Q. 685 (CCPA 1972); In re Fessman, 489 F.2d 742, 180 U.S.P.Q. 324 (CCPA 1974).

As to claim 10, Ruoff teaches the functional groups of hydroxyls, carboxyls, and ketones (see column 11, lines 12-15).

Claims 11, 13 and 14 are rejected as above.

As to claim 15, Ruoff teaches the functional groups of aminos and teaches amide bonds (see column 11, lines 43-54).

Claims 16, 18, and 19 are rejected as above.

As to claim 20, Ruoff teaches the functional group of hydroxy (see column 11, line 12-15).

Claims 21, 23, and 24 are rejected as above.

Claim Rejections - 35 USC § 103

Claims 1-3, 5-12, 14-17, 19-22 and 24 are rejected under 35 U.S.C. 103(a) as obvious over Lieber 6,159,742.

Insofar as the formula for Lieber does not match up to the present formula, it would have been obvious to provide bigger linking groups to be able to sorb more complicated molecules having many binding sites.

Claims 1-2, 4-11, 13-16, 18-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff 5,547,748.

The above reference does not necessarily require functionalization. However, the reference does suggest functionalizing and derivatizing (see column 11, lines 9-60). Therefore, it would have been obvious to functionalize the nanoencapsulate of the reference in order to use the nanoencapsulate for biological applications.

As to claim 6, Ruoff teaches functionalization. However, it does not teach the exact formula of claim 6. Nonetheless, it would have been obvious to chemically modify the nanoencapsulates in the same way as the present invention because Ruoff desires to provide bigger linking groups to be able to sorb more complicated molecules having many binding sites such as DNA. (see column 8, lines 52-67 and column 11, lines 42-54).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca M. Stadler whose telephone number is 571-272-5956.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

rms



STUART L. HENDRICKSON
PRIMARY EXAMINER